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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,706	12/04/2001	Erika Bellmann	56949US002	7608

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EXAMINER	
CLEVELAND, MICHAEL B	

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

A2

Office Action Summary	Application No.	Applicant(s)	
	10/004,706	BELLMANN ET AL.	
	Examiner	Art Unit	
	Michael Cleveland	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/21/02 and 3/3/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4 and 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the polymeric charge transfer layer" in line 1. There is insufficient antecedent basis for this limitation in the claim. For purposes of applying art, the examiner treated this limitation as referring to the "organic charge transfer layer" of parent claim 1.

Claims 18 and 20 recite the limitation "the charge transfer layer" in line 1. Claim 19 recites the limitation "the organic charge transfer layer" in line 1. There is insufficient antecedent basis for these limitations in the claims. For purposes of applying art, based on analogy to claim 1, the examiner treated these limitations as referring to the "organic layer" of parent claim 1 and as requiring the use of a(n organic) charge transfer layer in claims 18-20.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Moriyama et al. (U.S. Patent 6,152,374, hereafter '374).

'374 teaches

forming an organic layer (1) on a receptor substrate (3) (col. 4, lines 23-35);

forming a transfer element on a donor sheet(col. 5, lines 7-14);

roughening a surface of the organic layer using a plasma treatment (col. 4 lines 1-5); and

selectively thermally transferring a transfer element of a donor sheet to the surface of the organic layer after roughening the surface (col. 5, lines 7-14), from a surface that contacts the organic layer of the receptor substrate (col. 6, lines 9-12) .

5. Claims 16 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Emslander et al. (U.S. Patent 6,200,647, hereafter '647).

'647 teaches

forming an organic layer (12) on a receptor substrate (14) (col. 4, lines 45-65);

forming a transfer element on a donor sheet (col. 9, lines 19-37);

roughening a surface of the organic layer using a plasma treatment (col. 7, lines 58-65); and

selectively thermally transferring a transfer element of a donor sheet to the surface of the organic layer after roughening the surface from a surface that contacts the organic layer of the receptor substrate (col. 9, lines 19-37).

6. Claims 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Fisch et al. (U.S. Patent 5,372,987, hereafter '987).

'987 teaches

forming an organic layer on a receptor substrate (col. 9, lines 11-42);

forming a transfer element on a donor sheet (col. 14, lines 63-68);

roughening a surface of the organic layer using a plasma treatment (col. 14, lines 10-19); and

selectively thermally transferring a transfer element of a donor sheet to the surface of the organic layer after roughening the surface from a surface that contacts the organic layer of the receptor substrate (col. 9, lines 11-42).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 3-8, 10, 12-17, 19-20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burroughes et al. (U.S. Patent 6,558,219, hereafter '219) in view of Wolk et al. (U.S. Patent 6,114,088, hereafter '088).

Claims 1, 16: '219 teaches a method of forming a light emitting device comprising:

forming a charge transport layer (which may be organic, col. 5, lines 61-67) on a receptor substrate (col. 3, lines 55-67);

performing a plasma treatment on the surface of the charge transfer layer (thereby roughening it) to improve series resistance (col. 4, lines 1-21), and

depositing a light emitting material (for instance of polyphenylenevinylene (PPV))) on the charge transfer layer (col. 9, line 65-col. 10, line 7).

'219 does not teach depositing the light emitting material by selectively thermally transferring a transfer element of a donor sheet. However, the selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.,* 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07. '088 teaches that light emitting layers of EL devices may be transferred by thermal transfer from a donor element (col. 12, line 60-col. 13, line 30), and that materials such as PPV may be so transferred (col. 12, lines 1-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied the PPV light-emitting layer of '219 by the thermal transfer method of '088 with a reasonable expectation of

success because '088 teaches that thermal transfer is a suitable method of depositing light emitting layers of EL devices and that materials such as PPV may be so transferred.

Claims 3-4, 19: '219 teaches that the transfer layer may be a doped polyethylenedioxythiophene (PEDOT) (col. 8, lines 23-29).

Claims 5 and 20: The plasma partially oxidizes the layer; no other effect is described (col. 4, lines 16-22).

Claims 6-7: The plasma may comprise argon (col. 8, lines 38-41).

Claim 8: The plasma may comprise oxygen (col. 8, lines 23-26).

Claim 10: Plasma treatment may be for 20 s (Fig. 9).

Claim 12: '219 teaches that the PEDOT layer may be deposited on an indium tin oxide (ITO) electrode deposited on the substrate (col. 7, lines 29-60).

Claim 13: The plasma treatment does not substantially degrade the brightness (Compare Figs. 5-8; col. 9, lines 5-35).

Claims 14-15: The plasma treatment improves the operating voltage and efficiency (col. 9, lines 5-35; Fig. 9).

Claim 16: The donor element may contact the receptor ('088, col. 17, lines 66-67).

Claim 17: The layer to be deposited on the PEDOT film of '219 is organic (PPV) (col. 9, line 65-col. 10, line 5). Therefore, PPV must be the outermost (i.e., exposed) layer of the transfer film.

Claim 22: PPV is light-emitting (i.e., electrically active).

10. Claims 2, 11, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burroughes '219 and Wolk '088 as applied to claims 1 and 17 above, and further in view of Forrest et al. (U.S. Patent 6,580,027, hereafter '027).

Claims 2 and 18: '219 and '088 are described above, but do not explicitly teach that the surface of the charge transfer layer. '219 teaches that it is undesirable to require a greater drive voltage (col. 9, lines 58-64), as would be required by a greater resistance.

'027 teaches that the resistance of electrical devices comprising PEDOT is decreased even by mild plasma treatments (col. 9, lines 33-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the mild plasma

treatment of '027 in order to have achieved a degree of decreased series resistance as compared to an untreated layer. The conditions described by '027 (see, e.g., col. 12, lines 59-64) are milder than those taught by applicant (compare with current spec., p. 6), and therefore appear necessarily not to substantially chemically modify the surface of the PEDOT layer.

Claim 11: '027 teaches a suitable plasma treatment pressure of 100 mtorr (col. 12, lines 59-61).

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burroughes '219 and Wolk '088 as applied to claim 1 above, and further in view of Sekiguchi et al. (U.S. Patent 4,994,529, hereafter '529).

'219 and '088 are described above, but do not explicitly teach that the plasma contains nitrogen. '219 teaches that the oxidizing plasma may comprise a mixture of oxygen to oxidize and argon as a cooling diluent (col. 8, lines 24-40).

The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07. '529 teaches that oxidizing plasma treatments for polymers may comprise oxygen, oxygen and argon, or oxygen and nitrogen (col. 2, lines 16-29). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have performed the treatment of '219 in a mixture of oxygen and nitrogen with a reasonable expectation of success because '529 teaches that it is an suitable oxidizing plasma atmosphere.

12. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burroughes '219 and Wolk '088 as applied to claim 17 above, and further in view of Antoniadis et al. (U.S. Patent 4,994,529, hereafter '529).

'219 and '088 are described above, but do not explicitly teach that the thermal transfer occurs without exposure to air after roughening.

Antoniadis '688 teaches that in constructing electroluminescent devices, deposition of several consecutive layers without breaking a vacuum (i.e., without exposure to air) offers better reliability and economy of scale (col. 2, lines 50-63; col. 9, lines 15-38). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have

formed the light-emitting layer of '219 on the plasma treated hole-transporting layer without exposure to air after plasma treatment because '688 teaches that in constructing organic EL devices, deposition of several consecutive layers without breaking a vacuum (i.e., without exposure to air) offers better reliability and economy of scale.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Tuesday-Friday and alternate Mon, 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael Cleveland
Patent Examiner
February 5, 2004